

CURRICULUM VITAE

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I. Personal Data

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II. Education

- 1963 B.A., University of Massachusetts, Zoology.
1965 M.S., Cornell University, Fishery Science. Thesis title:
Food of pelagic young of the walleye *Stizostedion vitreum vitreum* (Mitchill), in
Oneida Lake, NY.
1968 Ph.D., Cornell University, Fishery Science. Dissertation title:
The relation of water currents and zooplankton abundance to distribution of larval
walleyes, *Stizostedion vitreum vitreum* in Oneida Lake, NY.

III. Professional Background

November 1980-Present	Professor, University of Maryland, Center for Environmental Science
Sept 1983- Sept1985	Director, Biological Oceanography Program, National Science Foundation, Washington, D. C. 20550.
July 1977- October 1980	Professor, Division of Biology and Living Resources, Rosenstiel School of Marine and Atmospheric Science (RSMAS), University of Miami, Miami, FL.
July 1974- June 1977	Associate Professor, Division of Biology and Living Resources, RSMAS, Miami, FL.
July 1971- June 1974	Assistant Professor, Division of Biology and Living Resources, RSMAS, Miami, FL.
July 1970- June 1971	Research Scientist, Division of Fishery Sciences, RSMAS, Miami, FL.

August 1968- July 1970 Fishery Research Biologist, Tropical Atlantic Biological Laboratory, Bureau of Commercial Fisheries, Miami, FL.

Awards and Special Recognition

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| 1996 | Warren Wooster Lecturer in Recruitment Oceanography. University of Washington, Seattle. <u>Three lectures</u> . "Subtleties and episodes in the early lives of fishes." |
| 1996 | Sea Grant Lecturer, Florida State University, Tallahassee. |
| 1997 | Beverton Medal for Excellence in Fisheries Research. Presented by Fisheries Society of the British Isles. Galway, Ireland. |
| 1998 | Oscar Elton Sette Award for Sustained Excellence in Marine Fishery Biology. American Fisheries Society. |
| 2000 | Elected Fellow, American Association for the Advancement of Science (AAAS). |
| 2001 | Regents Faculty Award for Public Service. University of Maryland System. |
| 2001 | Elected National Associate of the National Academy of Sciences. |
| 2003 | Chancellor's Distinguished Lecturer, Louisiana State University. |
| 2004 | President's Award for Excellence in the Application of Science, University of Maryland Center for Environmental Science. |
| 2006 | Conservationist-of-the-Year Award, Tidewater Chapter, American Fisheries Society |
| 2009 | Honorary Lifetime Membership. Fisheries Society of the British Isles. |
| 2010 | Excellence in Fisheries Education Award. Tidewater Chapter, American Fisheries Society |

IV. Research

A. Areas of Professional Expertise:

Fisheries ecology and oceanography, particularly the early-life stages of fishes; recruitment processes; trophodynamics, fisheries and marine resources management.

B. Publications:

1. Papers in Refereed Journals

Houde, E. D. 1964. The strigeid trematode, *Crassiphiala bulboglossa*, from the blacknose dace, *Rhinichthys atratulus*. Trans. Am. Fish. Soc. 93:304-306.

Houde, E. D. 1967. Food of pelagic young of the walleye, *Stizostedion vitreum vitreum*, in Oneida Lake, New York. Trans. Am. Fish. Soc. 96:17-34.

Houde, E. D. 1969. Sustained swimming ability of larvae of walleye, *Stizostedion vitreum vitreum* and yellow perch, *Perca flavescens*. J. Fish. Res. Bd. Canada. 26:1647-1659.

- Houde, E. D. and W. J. Richards. 1969. Rearing larval tunas in the laboratory. Commer. Fish. Rev. 31(12):32-34.
- Houde, E. D. 1969. Distribution of larval walleyes and yellow perch in a bay of Oneida Lake and its relation to water currents and zooplankton. N.Y. Fish Game J. 16:184-205.
- Houde, E. D., C. R. Futch and R. Detwyler. 1970. Development of the lined sole, Achirus lineatus, described from laboratory-reared and Tampa Bay specimens. Fla. Dept. Natur. Resour. Tech. Ser. 62:1-43.
- Houde, E. D. and J. L. Forney. 1970. Effect of water currents on distribution of walleye larvae in Oneida Lake, New York. J. Fish. Res. Bd. Can. 27:445-456.
- Houde, E. D. and B. J. Palko. 1970. Laboratory rearing of the clupeid fish Harengula pensacolae from fertilized eggs. Mar. Biol. 5:354-358.
- Detwyler, R. and E. D. Houde. 1970. Food selection by laboratory-reared larvae of the scaled sardine Harengula pensacolae (Pisces, Clupeidae) and the bay anchovy, Anchoa mitchilli (Pisces, Engraulidae). Mar. Biol. 7:214-222.
- Houde, E. D. and A. J. Ramsay. 1971. A culture system for marine fish larvae. Prog. Fish-Cult. 33:156-157.
- Houde, E. D. 1971. Developmental abnormalities of the flatfish, Achirus lineatus, reared in the laboratory. Fish. Bull., U. S. 69:537-544.
- Houde, E. D. 1972. Development and early life history of the northern sennet, Sphyraena borealis DeKay (Pisces, Sphyraenidae) reared in the laboratory. Fish. Bull., U. S. 70:185-195.
- Saksena, V. P. and E. D. Houde. 1972. Effect of food level on the growth and survival of laboratory-reared larvae of bay anchovy (Anchoa mitchilli Val.) and scaled sardine (Harengula pensacolae Goode and Bean). J. Exp. Mar. Biol. Ecol. 8:249-258.
- Futch, C. R., R. W. Topp and E. D. Houde. 1972. Developmental osteology of the lined sole, Achirus lineatus (Pisces: Soleidae). Contrib. Mar. Sci. 16:33-58.
- Saksena, V. P., C. Steinmetz, Jr. and E. D. Houde. 1972. Effects of temperature on growth and survival of laboratory-reared larvae of the scaled sardine, Harengula pensacolae Goode and Bean. Trans. Am. Fish. Soc. 101:691-695.
- Houde, E. D. 1973. Estimating abundance of sardine-like fishes from egg and larvae surveys, Eastern Gulf of Mexico: Preliminary Rept. Proc. Gulf. Carib. Fish. Inst. 25:68-78.
- Houde, E. D. and P. L. Fore. 1973. Guide to identity of eggs and larvae of some Gulf of Mexico clupeid fishes. Fla. Dept. Natur. Resour., Leaflet Ser. 4, No. 23, 14 pp.

- Houde, E. D. 1973. Some recent advances and unsolved problems in the culture of marine fish larvae. *Proc. World Maricult. Soc.* 3:83-112.
- Richards, W. J., R. V. Miller and E. D. Houde. 1974. Egg and larval development of the thread herring, *Opisthonema oglinum* (Le Sueur). *Fish. Bull., U. S.* 72:1123-1136.
- Houde, E. D., W. J. Richards and V. P. Saksena. 1974. Description of eggs and larvae of scaled sardine, *Harengula jaguana* Poey. *Fish. Bull., U. S.* 72:1106-1122.
- Houde, E. D. 1974. Effects of temperature and delayed feeding on growth and survival of larvae of three species of subtropical marine fishes. *Mar. Biol.* 26:271-285.
- Houde, E. D. 1975. Effects of stocking density and food density on survival, growth and yield of laboratory-reared larvae of sea bream, *Archosargus rhomboidalis* (L.) (Sparidae). *J. Fish Biol.* 7:115-127.
- Martinez, S. and E. D. Houde. 1975. Fecundity, sexual maturation and spawning of scaled sardine. *Bull. Mar. Sci.* 25:35-45.
- Houde, E. D. and L. J. Swanson, Jr. 1975. Description of eggs and larvae of yellowfin menhaden *Brevoortia smithi*. *Fish Bull., U. S.* 73:660-673.
- Houde, E. D. 1976. Abundance and potential for fisheries development of some sardine-like fishes in the eastern Gulf of Mexico. *Proc. Gulf Carib. Fish. Inst.* 28:73-82.
- Houde, E. D., S. A. Berkeley, J. J. Klinovsky and R. C. Schekter. 1976. Culture of larvae of the white mullet, *Mugil curema* Valenciennes. *Aquaculture* 8:365-370.
- Houde, E. D. and N. Chitty. 1976. Seasonal abundance and distribution of zooplankton, fish eggs, and fish larvae in the eastern Gulf of Mexico, 1972-1974. NOAA Tech. Rept. NMFS, Spec. Sci. Rep.-Fish. 701, 18 pp.
- Houde, E. D. and T. Potthoff. 1976. Egg and larval development of the sea bream *Archosargus rhomboidalis* (Linnaeus): Pisces, Sparidae. *Bull. Mar. Sci.* 26:506-529.
- Houde, E. D. 1977. Abundance and potential yield of the round herring, *Etrumeus teres*, and aspects of its early life history in the eastern Gulf of Mexico. *Fish. Bull., U. S.* 75:61-89.
- Houde, E. D. 1977. Abundance and potential yield of the thread herring, *Opisthonema oglinum*, and aspects of its early life history in the eastern Gulf of Mexico. *Fish. Bull., U. S.* 75:493-512.
- Houde, E. D. 1977. Abundance and potential yield of the scaled sardine, *Harengula jaguana*, and aspects of its early life history in the eastern Gulf of Mexico. *Fish. Bull., U. S.* 75:613-628.

- Houde, E. D. 1977. Food concentration and stocking density effects on survival and growth of laboratory-reared larvae of bay anchovy, *Anchoa mitchilli* and lined sole, *Achirus lineatus*. Mar. Biol. 43:333-341.
- Houde, E. D. 1978. Critical food concentrations for larvae of three species of subtropical marine fishes. Bull. Mar. Sci. 28:395-411.
- Berkeley, S. A. and E. D. Houde. 1978. Biology of two exploited species of halfbeaks, *Hemiramphus brasiliensis* and *H. balao* from southeast Florida. Bull. Mar. Sci. 28:624-644.
- Houde, E. D. and R. C. Schekter. 1978. Simulated food patches and survival of larval bay anchovy, *Anchoa mitchilli* and sea bream, *Archosargus rhomboidalis*. Fish. Bull., U. S. 76:483-487.
- Houde, E. D. and A. K. Taniguchi. 1979. Laboratory culture of marine fish larvae and their role in marine environmental research. pp. 176-205, In: The state of marine environmental research proceedings of a symposium. U. S. Environmental Protection Agency. EPA-600/9-79-035.
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- Houde, E. D. 1981. Distribution and abundance of four types of codlet (Pisces: Bregmacerotidae) larvae from the eastern Gulf of Mexico. Biol. Oceanogr. 1:81-104.
- Houde, E. D. 1982. Kinds, distribution and abundances of sea bass larvae (Pisces: Serranidae) from the eastern Gulf of Mexico. Bull. Mar. Sci. 35:511-522. UMCEES Contrib. No. 1136.
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- Houde, E. D. and R. C. Schekter. 1983. Oxygen uptake and comparative energetics among eggs and larvae of three subtropical marine fishes. Mar. Biol. 72:283-293. UMCEES Contrib. No. 1376.
- Houde, E. D. and J. Alpern-Lovdal. 1984. Seasonality of occurrence, foods and food preferences of ichthyoplankton in Biscayne Bay, Florida. Estuarine, Coastal Shelf Sci. 18:403-419. UMCEES Contrib. No. 1534.
- Milliken, D. M. and E. D. Houde. 1984. A new species of Bregmacerotidae (Pisces), *Bregmaceros cantori*, from the western Atlantic Ocean. Bull. Mar. Sci. 35:11-19. UMCEES Contrib. No. 1562.
- Houde, E. D. and J. D. Alpern-Lovdal. 1985. Patterns of variability in ichthyoplankton occurrence and abundance in Biscayne Bay, Florida. Estuarine Coastal Shelf Sci. 20:79-103. UMCEES Contrib. No. 1584.
- Almatar, S. and E. D. Houde. 1986. Distribution and abundance of the sardine *Sardinella fimbriata* (Val.) eggs in Kuwait waters of the Arabian Gulf. Fish. Res. 4:331-342. UMCEES Contrib. No. 1789.
- Houde, E. D. and L. Lubbers III. 1986. Survival and growth of striped bass, *Morone saxatilis*, and *Morone* hybrid larvae: laboratory and pond enclosure experiments. Fish. Bull., U. S. 84:904-914. UMCEES Contrib. No. 1721.
- Houde, E. D., S. Almatar, J. C. Leak and C. E. Dowd. 1986. Ichthyoplankton abundance and diversity in the western Arabian Gulf. Kuwait Bull. Mar. Sci. 8:107-393. UMCEES Contrib. No. 1860.
- Leak, J. C. and E. D. Houde. 1987. Cohort growth and survival of bay anchovy *Anchoa mitchilli* larvae in Biscayne Bay, Florida. Mar. Ecol. Prog. Ser. 37:109-122. UMCEES Contrib. No. 1793.
- Houde, E. D. 1987. Fish early life dynamics and recruitment variability. Am. Fish. Soc. Symp. 2:17-29. UMCEES Contrib. No. 1744.
- Bailey, K. M. and E. D. Houde. 1989. Predation on eggs and larvae of marine fishes and the recruitment problem. Adv. Mar. Biol. 25:1-83. UMCEES Contrib. No. 1985.
- Houde, E. D. 1989. Subtleties and episodes in the early life of fishes. J. Fish Biol. 35(Suppl. A):29-38. UMCEES Contrib. No. 2108.
- Houde, E. D. 1989. Comparative growth, mortality and energetics of marine fish larvae: temperature and implied latitudinal effects. Fish. Bull., U. S. 87:471-495. UMCEES Contrib. No. 2136.

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- Houde, E. D., P. B. Ortner, L. Lubbers, III and S. R. Cummings. 1989. Test of a camera-net system to determine abundance and heterogeneity in anchovy egg distributions. Rapp. P.-v. Réun. Cons. Int. Explor. Mer 191:112-118. UMCEES Contrib. No. 2115.
- Houde, E. D. 1990. Reproductive variability: implications for the dynamics and well-being of fish stocks. Introduction to selected papers. J. Cons. int. Explor. Mer 47:248. UMCEES Contrib. No. 2209.
- Tuncer, H., R. M. Harrell and E. D. Houde. 1990. Comparative energetics of striped bass (*Morone saxatilis*) and hybrid (*M. saxatilis* X *M. chrysops*) juveniles. Aquaculture 86:387-400. UMCEES Contrib. No. 2076.
- Tuncer, H., R. M. Harrell and E. D. Houde. 1990. Comparative food acceptance and consumption of striped bass and hybrid larvae. J. World Aquacult. Soc. 21:225-234. UMCEES Contrib. No. 2123.
- Monteleone, D. M. and E. D. Houde. 1990. Influence of maternal size on survival and growth of striped bass, *Morone saxatilis*, eggs and larvae. J. Exp. Mar. Biol. Ecol. 140:1-11. UMCEES Contrib. No. 2161.
- Cowan, J. H., Jr. and E. D. Houde. 1990. Growth and survival of bay anchovy (*Anchoa mitchilli*) larvae in mesocosm enclosures. Mar. Ecol. Prog. Ser. 68:47-57. UMCEES Contrib. No. 2163.
- Zastrow, C. E., E. D. Houde and L. G. Morin. 1991. Spawning, fecundity, hatch-date frequency and young-of-the-year growth of bay anchovy *Anchoa mitchilli* in mid-Chesapeake Bay. Mar. Ecol. Prog. Ser. 73:161-171. UMCEES Contrib. No. 2218.
- Monteleone, D. M. and E. D. Houde. 1992. Vulnerability of striped bass (*Morone saxatilis* Walbaum) eggs and larvae to predation by juvenile white perch (*Morone americana* Gmelin). J. Exp. Mar. Biol. Ecol. 158:93-104. UMCEES Contrib. No. 2385.
- Cowan, J. H., Jr., R. S. Birdsong, E. D. Houde, J. S. Proest, W. C. Sharp and G. B. Mateja. 1992. Enclosure experiments on survival and growth of black drum eggs and larvae in lower Chesapeake Bay. Estuaries 15:392-402. UMCEES Contrib. No. 2287.
- Cowan, J. H., Jr. and E. D. Houde. 1992. Size-dependent predation on marine fish larvae by ctenophores, scyphomedusae and planktivorous fish. Fish. Oceanogr. 1:113-126. UMCEES Contrib. No. 2386.
- Cowan, J. H., Jr., K. A. Rose, E. S. Rutherford and E. D. Houde. 1993. Individual-based model of young-of-the-year striped bass population dynamics. II. Factors affecting

- recruitment in the Potomac River, Maryland. Trans. Am. Fish. Soc. 122:439-458. UMCEES Contrib. No. 2454.
- Olney, J. E. and E. D. Houde. 1993. Evaluation of in situ silhouette photography in investigations of estuarine zooplankton and ichthyoplankton. Bull. Mar. Sci. 52:845-872. UMCEES Contrib. No. 2514.
- Houde, E. D. and C. E. Zastrow. 1993. Ecosystem- and taxon-specific dynamics and energetics properties of larval fish assemblages. Bull. Mar. Sci. 53:290-335.
- Houde, E. D. and E. S. Rutherford. 1993. Recent trends in estuarine fisheries: predictions of fish production and yield. Estuaries 16:161-176. UMCEES Contrib. No. 2467.
- Cowan, J. H., Jr. and E. D. Houde. 1993. Relative predation potentials of scyphomedusae, ctenophores and planktivorous fish on ichthyoplankton in Chesapeake Bay. Mar. Ecol. Prog. Ser. 95:55-65. UMCEES Contrib. No. 2425.
- Rose, K. A., J. H. Cowan, Jr., E. D. Houde and C. C. Coutant. 1993. Individual-based modelling of environmental quality effects on early life stages of fishes: a case study using striped bass. Am. Fish. Soc. Symp. 14:125-145. UMCEES Contrib. No. 2515.
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- Breitburg, D. L., N. Steinberg, S. Dubeau, C. Cooksey and E. D. Houde. 1994. Effects of low dissolved oxygen on predation on estuarine fish larvae. Mar. Ecol. Prog. Ser. 104:235-246. UMCEES Contrib. No. 2640.
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- Rutherford, E. S., E. D. Houde and R. M. Nyman. 1997. Relationship of larval-stage growth and mortality to recruitment of striped bass, *Morone saxatilis*, in Chesapeake Bay. Estuaries 20:174-198. UMCEES Contrib. No. 3074.
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2. Books or Chapters

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Houde, E. D. and L. W. Harding, Jr. 2009. Menhaden abundance and productivity in Chesapeake Bay: linking the environment and primary production to variability in fish recruitment. Final Report to NOAA Chesapeake Office, Grant No. NA04NMF4570359. [UMCES] CBL-09-014.

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Houde, E. D. (Chair, Team Leader), E. Annis, K. Friedland, C. Jones, R. Johnson, A. Sharov, J. Smith, B. Spear, J. Uphoff, D. Vaughan, M. Topolski and D. Lipton. 2009. Menhaden species team: background and issues briefs. Maryland Sea Grant, Ecosystem based fisheries management for Chesapeake Bay. (<http://www.mdsg.umd.edu/programs/policy/ebfm/bioteam/menhaden/>)

C. Contracts and Grants (2000-present)

Multiscale experimental ecosystem research center. U.S. Environmental Protection Agency. 1992-2003. Approx. \$10 million. (Several Co-Investigators, 10% time).

Trophic transfers in large estuarine ecosystems: pulsed inputs, physical features and biological patchiness. National Science Foundation. 1994-2001. \$2,999,963. Co-Principal Investigator. 10% time.

Recruitment processes in estuarine fishes: patterns, scale, and ontogenetic trends. National Science Foundation. 1995-2001. \$669,703. Principal Investigator. 12% time.

Comparison of habitat use by juvenile bluefish between Chesapeake Bay sub-estuaries and Maryland's coastal bays. NOAA/National Marine Fisheries Service through Rutgers University. 1998-2001. \$169,019. Co-Principal Investigator. 12% time.

Estuarine and coastal dependency of juvenile bluefish in Maryland's Chesapeake Bay and coastal zone. NOAA/National Marine Fisheries Service through Rutgers University. 2000-2001. \$100,000. Co-Principal Investigator. 5% time.

How do estuarine turbidity maxima entrap particles, retain zooplankton, and promote recruitment of fish? National Science Foundation. 2000-2003. \$1,322,141. Co-Principal Investigator. 12.5% time.

Variability in the dynamics of forage fish abundance in Chesapeake Bay: retrospective analysis, models and synthesis. NOAA, Chesapeake Bay Stock Assessment Committee. 2000-2001. \$41,724. Principal Investigator. 5% time.

Trophic complexity and scaling issues: fish predators in MEERC. U.S. EPA (MEERC). 1996-2003. \$318,309. (Principal Investigator, 15% time).

Recruitment of young-of-the-year bluefish: patterns, pulses and processes in the Chesapeake Bay estuarine system. Rutgers University and National Marine Fisheries Service. 1998-2002. \$78,689. (Co-Principal Investigator, 14% time).

Dynamics and trends in forage fish abundances and their role in the Chesapeake Bay ecosystem. UMCES, Integration and Application Network (IAN). 2000-2002. \$44,560. (Principal Investigator, 5% time).

Evaluating and improving larval stocking as a method to restore American shad in Chesapeake Bay. NOAA, Maryland Sea Grant. 2000-2004. \$187,871. (Co-Principal Investigator, 12.5%).

Variability in the dynamics of forage fish in Chesapeake Bay: retrospective analysis, models and synthesis. NOAA, Chesapeake Bay Stock Assessment Committee. 2000-2003. \$126,729. (Principal Investigator, 5% time).

Development and implementation of the Chesapeake Bay fishery-independent multispecies survey (CHESFIMS). NOAA, Chesapeake Bay Stock Assessment Committee. 2001-2005. \$1,334,096. (Co-Principal Investigator, 10% time).

Toward the census of marine life: Proof of concept. Sloan Foundation. 2001-2003. \$250,000. (Co-Principal Investigator, 5% time).

Atlantic Coast Environmental Indicators Consortium (ACE INC.). Trophic indicators of ecosystem health in Chesapeake Bay. U.S. Environmental Protection Agency. 2001-2006. \$1,977,715. (Co-Principal Investigator, 10% time).

Ecosystem variability and estuarine fisheries. NOAA, Coastal Ocean Program. 2002-2005. \$585,502. (Co-Principal Investigator, 10% time).

Coastal dependency of juvenile bluefish in the Middle Atlantic Bight. NOAA/National Marine Fisheries Service through Rutgers University. 2003-2004. \$145,181. (Co-Principal Investigator, 10% time).

SGER: Hurricane Isabel impacts on Chesapeake Bay. National Science Foundation. 2003-2004. \$100,000. (Co-Principal Investigator, 5% time).

Temporal and spatial variability in growth and production of Atlantic menhaden and bay anchovy in Chesapeake Bay. NOAA, Chesapeake Bay Office. 2004-2006. \$170,874. (Principal Investigator, 8.5% time).

Primary production, spring blooms and control of recruitment in pelagic fish. MD Maryland Sea Grant. 2005-2007. \$99,945. (Co-Principal Investigator, 8.5% time).

Coastal patterns of juvenile recruitment in the Mid- and South-Atlantic Bight: DelMarVa (Field Season). NOAA, via Rutgers University. 2004-2005. \$70,076. (Co-Principal Investigator, 2% time).

Coastal patterns of juvenile recruitment in Mid- and South-Atlantic Bight: DelMarVa (Lab Work). NOAA, via Rutgers University. 2004-2006. \$85,761. (Co-Principal Investigator, 6.5% time).

Dynamic stability and particle transformations: Tracing pathways of production in estuarine turbidity maxima. National Science Foundation. 2005-2010. \$2,500,000. (Lead Principal Investigator, 20% time).

Competitive application for Maryland Sea Grant Research Fellow. Maryland Sea Grant; 2005-2006. ~\$34,500. (Principal Investigator). Award made to student Edward J. Martino.

Menhaden abundance and productivity in Chesapeake Bay: linking the environment and primary production to variability in fish recruitment. NOAA Chesapeake Office. 2004-2008. \$523,790. (Co-Principal Investigator, 20% time).

Coastal patterns of juvenile recruitment in the Mid- and South-Atlantic Bight: DelMarVa (Field Season). NOAA, via Rutgers University. 2004-2005. \$70,076. (Co-Principal Investigator, 2% time).

Temporal and spatial variability in growth and production of Atlantic menhaden and bay anchovy in Chesapeake Bay. Maryland Department of Natural Resources and

Atlantic States Marine Fisheries Commission. 2005-2007. \$239,454.
(Co-Principal Investigator, 8.5% time).

Temporal and spatial variability in growth and production of Atlantic menhaden and bay anchovy in Chesapeake Bay. Maryland Department of Natural Resources and NOAA Chesapeake Bay Office. 2006-2008. \$272,144. (Co-Principal Investigator, 12.5% time).

Temporal and spatial variability in larval influx, production, and recruitment of young-of-the-year Atlantic menhaden and bay anchovy in Chesapeake Bay: Year 3. Maryland Department of Natural Resources and NOAA Chesapeake Bay Office. 2007-2009. \$220,149. (Co-Principal Investigator, 12.5% time).

Dynamics of ichthyoplankton ingress from the coastal ocean into Chesapeake and Delaware Bays. Maryland Sea Grant, 2007-2010. \$186,000. (Co-Principal Investigator, 8.5% time).

Temporal and spatial variability in larval influx, production, and recruitment of young-of-the-year Atlantic menhaden and bay anchovy in Chesapeake Bay. Maryland Department of Natural Resources, 2008-2010. \$115,306. (Co-Principal Investigator, 17% time).

Fisheries habitat products team: a MD DNR – NOAA – CBL partnership coordinated by the Cooperative Oxford Laboratory, 2008-2010. \$99,996. (Principal Investigator, 8.5% time).

A Cooperative Institute for the North Atlantic Region. NOAA. 2009-2013. Five institutional partners: WHOI, Univ. Maine, Gulf of Maine Res. Inst., Rutgers Univ., UMCES. Funding levels variable from year to year. (Co-Principal Investigator and Team Leader, 12.5% time).

Recruitment of Atlantic menhaden: dynamics and ecology of the larval-juvenile transition in Chesapeake Bay. NOAA Chesapeake Bay Office and Maryland Department of Natural Resources, 2009-2010. \$200,000. (Co-Principal Investigator, 12.5% time).

Recruitment of Atlantic menhaden: dynamics and ecology of the larval-juvenile transition in Chesapeake Bay. NOAA Chesapeake Bay Office and Maryland Department of Natural Resources, 2009-2011. \$200,000. (Co-Principal Investigator, 12.5% time).

Collaborative research: Hypoxia in marine ecosystems: implications for neritic copepods. National Science Foundation. 2010-2012. \$1,114,711 (Co-Principal Investigator, 8.5% time).

D. Invited Seminars and Presentations (since 2001)

Houde, E. D. 2001. Dredging windows: recruitment processes and overwintering of anadromous fish in estuaries. National Research Council, Transportation Research Board, Conference on “Environmental Windows for Dredging,” Washington, D.C.

- Houde, E. D. 2001. Networking issues and concerns with regard to implementation of Marine Protected Areas. NOAA Coastal Ocean Program 'Networks Workshop,' Silver Spring, MD.
- Houde, E. D. 2001. Science issues and needs to support fisheries management. Testimony to U.S. House of Representatives, Committee on Resources, Subcommittee on Fisheries, Conservation, Wildlife and Oceans (testimony regarding reauthorization of the Magnuson-Stevens Sustainable Fisheries Act). Washington D.C.
- Houde, E. D. 2001. Mesocosms and marine research. John Steele Symposium. Woods Hole Oceanographic Institution, Woods Hole, MA.
- Houde, E. D. 2001. Academic excellence and eminence in Maryland's educational institutions. Invited testimony. Maryland Higher Education Commission, Washington College, Chestertown, MD.
- Houde, E. D. 2001. A National Academy perspective on Marine Protected Areas in the USA. MPA Symposium, Woods Hole Oceanographic Institution, Woods Hole, MA.
- Houde, E. D. 2001. Marine Protected Areas. Chesapeake Biological Laboratory, Solomons, MD.
- Houde, E. D. 2002. The state of marine fisheries and management. Chair of a Panel Discussion, American Museum of Natural History, New York, NY.
- Houde, E. D. 2002. Determinants of recruitment success in anadromous and estuary-spawning fishes. American Fisheries Society, Baltimore, MD.
- Houde, E. D. 2002. Testimony: Discussion draft of legislation to reauthorize the Magnuson-Stevens Fishery Conservation and Management Act. U.S. House of Representatives, Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife and Oceans, Washington, D.C.
- Houde, E. D. 2002. Testimony: Use of marine protected areas (MPAs) as a fisheries management tool, as a means to protect and restore marine ecosystems, and as a research tool. U.S. House of Representatives, Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife and Oceans, Washington, D.C.
- Houde, E. D. 2002. The state of the world's fisheries. National Press Foundation, Washington, D.C.
- Houde, E. D. 2003. Marine fisheries: science and management to attain sustainability. Chancellor's Lecture, Louisiana State University, Baton Rouge, LA.
- Houde, E. D. 2003. What controls and regulates recruitment in estuarine-dependent fishes? School of the Coast and Environment, Louisiana State University, Baton Rouge, LA.
- Houde, E. D. 2003. Dynamics and trends in forage fish abundance. UMCES Integration and Application Network, Current Projects and Future Directions. College Park, MD.

- Houde, E. D. 2003. Global fisheries and their sustainability. Maryland Sea Grant, College Park, MD.
- Houde, E. D. 2003. Global fisheries: are they sustainable? Invited presentation to Research Experiences for Undergraduates (REU) students. Solomons, MD.
- Houde, E. D. 2003. Marine protected areas: an old tool for new circumstances. Symposium Keynote Presentation. American Fisheries Society Annual Meeting, Quebec City, Quebec, Canada.
- Houde, E. D. 2003. Dancing in Hjort's shadow. Keynote Plenary Talk. American Fisheries Society, Early Life History Section, Santa Cruz, CA.
- Houde, E. D. 2003. Fish recruitments: biology, physics, and features in estuarine ecosystems. Estuarine Research Federation Biennial Meeting, Seattle, WA.
- Houde, E. D. 2003. Are marine fisheries sustainable? Honors Program Lecture, Gallaudet University, Washington, D.C.
- Houde, E. D. 2003. The Chesapeake Bay Fisheries Ecosystem Plan. Conference on Managing Our Nation's Fisheries, Regional Fisheries Management Councils, Washington, D.C.
- Houde, E. D. 2004. Fisheries ecosystem planning for Chesapeake Bay. Chesapeake Bay Fisheries Research Symposium. Sponsored by NOAA Chesapeake Bay Office, Laurel, MD..
- Houde, E. D. 2004. The Chesapeake Bay Fisheries Ecosystem Plan. Living Resources Subcommittee, Chesapeake Bay Program, Annapolis, MD.
- Houde, E. D. 2004. Fisheries management: can we improve its performance? Panel on Chesapeake Bay: past, present, future. Atlantic Estuarine Research Society, Salisbury, MD.
- Houde, E. D. 2004. Marine fisheries: management and sustainability. St. Mary's College, lecture to class in Biology of Fishes, St. Mary's City, MD.
- Houde, E. D. 2004. Managing for sustainability. Lecture to CBL Docents, Solomons, MD.
- Houde, E. D. 2004. The Fisheries Ecosystem Plan. Maryland Department of Natural Resources. Presented to administrators, Annapolis, MD.
- Houde, E. D. 2004. The Chesapeake Bay Fisheries Ecosystem Plan. South Atlantic Fisheries Management Council, Key West, FL.
- Houde, E. D. 2004. Spatial management, protected areas, and fisheries ecosystem planning in Chesapeake Bay. International Council for the Exploration of the Sea, Annual Science Conference, Vigo, Spain.
- Houde, E. D. 2004. Summary of the workshop and possible ecosystem-based approaches in fisheries management. Atlantic States Marine Fisheries Commission, Menhaden Workshop/Meeting, 13-14 Oct. 2004, Alexandria, VA.

- Houde, E. D. 2005. Three facts: Fisheries in Chesapeake Bay. Chesapeake Bay Commission, Annapolis, MD, 6 Jan. 2005.
- Houde, E. D. 2005. New circumstances demand broader implementation of spatial approaches: Knowns and unknowns in MPA science. Marine Protected Areas Federal Advisory Committee, Arlington, VA, 16 Feb. 2005.
- Houde, E. D. 2005. Beyond stock and recruitment: including age structure in recruitment theory. American Association for the Advancement of Science, Annual Meeting, Washington, D.C., 19 Feb. 2005.
- Houde, E. D. 2005. Panel moderator: New fisheries: science and management sustaining fisheries. American Association for the Advancement of Science, Annual Meeting, Washington, D. C., 21 Feb. 2005.
- Houde, E. D. 2005. Development of ecosystem-based approaches to fisheries management in Chesapeake Bay. Keynote Talk, Interagency Ecological Program, San Francisco Estuary, Monterey, CA, 2 Mar. 2005.
- Houde, E. D. 2005. Planning for ecosystem-based fisheries management in Chesapeake Bay. Living Marine Resources Cooperative Science Center, University of Maryland Eastern Shore, Princess Anne, MD, 6 Apr. 2005.
- Houde, E. D. 2005. Reproductive risks and recruitment variability in striped bass. School of Marine Science and Technology, University of Massachusetts at Dartmouth, Dartmouth, MA, 28 Apr. 2005.
- Houde, E. D. 2005. Biomass size spectra and size-based indicators of stress in estuaries. Eutrophication and Fisheries, Multi-stressors Workshop, Smithsonian Environmental Research Center, Edgewater, MD, 17 May 2005.
- Houde, E. D. 2005. Are marine fisheries sustainable? Invited lecture to Research Experience for Undergraduates, Maryland Sea Grant, Chesapeake Biological Laboratory, Solomons, MD, 9 Jun. 2005.
- Houde, E. D. 2005. Developing and implementing ecosystem-based approaches to fisheries Norfolk, VA, 20 Oct. 2005.
- Houde, E. D. 2005. Early life history and recruitment dynamics of marine fishes: emerging from Hjort's shadow. Dynamics of the Marine Biosystem Symposium, Tokyo, Japan, 17 Nov. 2005.
- Houde, E. D. 2005. The control and regulation of recruitment levels in Chesapeake Bay striped bass. Laboratory of Estuarine Ecology, Kyoto University, Kyoto, Japan, 21 Nov. 2005.

- Houde, E. D. 2006. Emerging from Hjort's shadow: why do fish stocks have variable recruitments? Horn Point Laboratory, University of Maryland Center for Environmental Science, Cambridge, MD. 1 Feb. 2006.
- Houde, E. D. 2006. Fisheries ecosystem planning: can ecosystem-based approaches be instituted in Chesapeake Bay? Fort Johnson Marine Science Seminar Series; Hollings Marine Laboratory, Charleston, SC. 21 Apr. 2006.
- Houde, E. D. 2006. Atlantic menhaden: variability in abundance, recruitment and productivity. NOAA Chesapeake Bay Office 2006 Integrated Research Symposium, Williamsburg, VA. 26 Apr. 2006.
- Houde, E. D. 2006. Ecosystem-based approaches to fisheries management: planning for Chesapeake Bay. Marine Fish Conservation Network, Keynote Presentation, Annual Meeting, Alexandria, VA. 6 June 2006.
- Houde, E. D. 2007. Good science, good management, and good luck: collapse and recovery of striped bass. Invited seminar. Duke University Marine Laboratory, Beaufort, NC. 21 March 2007.
- Houde, E. D. 2007. Fisheries research at the Chesapeake Biological Laboratory. Dedication of the Fisheries Research Complex Building, Solomons, MD. 21 May 2007.
- Houde, E. D. 2007. Welcoming remarks. PICES-ICES Young Scientists Conference, Baltimore, MD. 26 June 2007.
- Houde, E. D. 2007. Chesapeake portraits: fish and fisheries in a challenged ecosystem. Invited talk, American Fisheries Society, Annual Meeting, San Francisco, CA. 6 September 2007.
- Houde, E. D. 2007. Emerging from Hjort's shadow. Invited Keynote talk, North Atlantic Fisheries Organization, ICES and PICES, Symposium on Reproductive and Recruitment Processes in Exploited Marine Fish Stocks, Lisbon, Portugal, 1 October 2007.
- Houde, E. D. 2007. Ecosystem-based fisheries management: a challenge for Chesapeake Bay. Chesapeake Bay Program, MD-VA Sea Grant, and NOAA, Workshop on Economics of Ecosystem-based Fisheries Management Plans in the Chesapeake Bay, Washington, D.C. 16 October 2007.
- Houde, E. D. 2008. Fish stock assessment and fisheries management. Maryland Task Force on Fisheries Management, Annapolis, MD. 8 January 2008.
- Houde, E. D. 2008. Forage fisheries: managing for sustainability and ecosystem services. Marine Fish Conservation Network, Annapolis, MD. 13 March 2008.
- Houde, E. D., L. W. Harding, Jr., E. Annis and M. Mallonee. 2008. Menhaden YOY recruitment variability and primary production in Chesapeake Bay. NOAA Chesapeake Bay Office, Webinar Series on Menhaden Research. 28 May 2008.

- Houde, E. D., C. Lozano, and A. Hashinaga. 2008. Menhaden larval ingress: Chesapeake Bay mouth. NOA Chesapeake Bay Office, Webinar Series on Menhaden Research. 28 May 2008.
- Annis, E., E. D. Houde, M. Mallonee and W. Wilberg. 2008. Bioenergetics modeling of YOY Atlantic menhaden growth in Chesapeake Bay: Interannual variability in growth and growth potential. NOAA Chesapeake Bay Office, Webinar Series on Menhaden Research. 6 June 2008.
- Houde, E. D. 2008. Men, menhaden, and ecosystem-based fishery management. Research Experience for Undergraduates, Maryland Sea Grant, UMCES Seminar Series. 11 July 2008.
- Grimes, C. B. and E. D. Houde. 2008. Oceanography and reproductive strategies of tunas and mackerels. American Fisheries Society Annual Meeting, Ottawa, Canada. 19 August 2008.
- Houde, E. D. 2008. CAMEO: Town Hall Meeting. "Perspectives." National Science Foundation and NOAA, Ottawa, Canada. 19 August 2008.
- Houde, E. D. 2008. Recruitment variability: emerging from Hjort's shadow and abandoning the search for the Holy Grail. Virginia Institute of Marine Science, Gloucester Pt., VA. 5 November 2008.
- Houde, E. D. 2009. Developing, adopting, and implementing EBFM in Chesapeake Bay. Chesapeake Research Consortium, Conference on Ecosystem Based Management, Baltimore, MD. 23 March 2009.
- Houde, E. D., C. Lozano and A. Hashinaga. 2009. Ingress of larval Atlantic menhaden to Chesapeake Bay: supply-side dynamics. NOAA Chesapeake Bay Office Research Symposium, Laurel, MD. 22 April 2009.
- Houde, E. D., E. A. Annis, L. W. Harding, Jr. and M. J. Wilberg. 2009. Menhaden abundance and productivity: linking recruitment variability to environment and primary production in Chesapeake Bay. NOAA Chesapeake Bay Office Research Symposium, Laurel, MD. 22 April 2009.
- Houde, E. D. 2009. Forage fish and fisheries in Chesapeake Bay. Lenfest Foundation, Task Force on Forage Fishes, Alexandria, VA. 18 May 2009.
- Houde, E. D. 2009. Men and menhaden: managing for sustainability and a healthy Bay ecosystem. Chesapeake Biological Laboratory, Science Social, Solomons, MD. 24 June 2009.
- Houde, E. D. 2009. EBFM in Chesapeake Bay. New England Fisheries Management Council, Workshop/Symposium on EBFM, Newport, RI. 27 August 2009.
- Houde, E. D. 2010. Solving the recruitment problem: the Holy Grail of fisheries science. Hatfield Marine Science Center, Distinguished Lecturer, Newport, OR. 21 January 2010.

- Houde, E. D. 2010. Men and menhaden: fisheries, management, and policy in Chesapeake Bay. Hatfield Marine Science Center, Distinguished Lecturer, Newport, OR. 22 January 2010.
- Houde, E. D. 2010. Planning for ecosystem-based fisheries management in Chesapeake Bay. University of Maryland Eastern Shore, Princess Anne, MD. 1 February 2010.
- Houde, E. D. 2010. Forty Years of fisheries science on Chesapeake Bay. Science Symposium: Forty years of science on Chesapeake Bay. Salisbury University, Salisbury, MD. 13 February 2010.
- Houde, E. D. 2010. How does fisheries science support marine resources policy and management? AGU-ASLO-TOS Ocean Sciences Meeting, Portland, OR. 26 February 2010.
- Houde, E. D. 2010. What do we know about death in the sea? ICES Workshop on Mortality in the Sea (WKMOR), Aberdeen, Scotland. 22 March 2010.
- Houde, E. D. 2010. Emerging from Hjort's Shadow. University of South Florida, School of Marine Science, St. Petersburg, FL. 23 April 2010.

V. Outreach and Service (selected activities since 2004)

A. Editorships

Estuaries and Coasts. Associate Editor for Fisheries, 2008-

B. Public Service

Radio Interview. Public radio, 'Ecosystem-Based Fisheries Management.' Discussed and explained EBFM; interview was based on a paper in *Science* by Pikitch et al. (2004). I was an author. July 2004.

Popular Article. 'Fisheries likely to revive.' (story on post-Hurricane Katrina potential for fisheries in the Gulf of Mexico). *Solomons Sketches*, Vol. 8, No. 3, page 4. 2005.

CBL Docents Invited Lecture; "Chesapeake Bay Fisheries: Managing for Sustainability," May 2004.

Reviewer, Popular Booklet on "Sustaining Fisheries and Marine Ecosystems," for NAS-NRC, September 2007.

Popular Article. 'Bold new science and precautionary management.' *Solomons Sketches*, Vol. 10, No. 1, pp. 4-5. 2007.

Public lecture. "Men and Menhaden: Fish Men and menhaden: managing for sustainability and a healthy Bay ecosystem." Chesapeake Biological Laboratory, Science Social, Solomons, MD. 24 June 2009.

Maryland Sea Grant Newsletter Article. “Managing Atlantic menhaden in Chesapeake Bay: an ecosystem perspective. Ecosystem-based fisheries management in Chesapeake Bay, Maryland Sea Grant. July 2009.
(<http://www.mdsg.umd.edu/programs/policy/ebfm/update/july09/>)

C. Federal/State/Local Government

Living Resources Subcommittee, Chesapeake Bay Program, 1987-

Fishery Management Plan Coordination Workgroup, Chesapeake Bay Program, 1989-

Scientific and Technical Advisory Committee (STAC), Chesapeake Bay Program, 1992-2005.

Bi-State Blue Crab Advisory Committee’s Technical Advisory Group, 1996-

NOAA Chesapeake Bay Program. Co-Chair of Expert Panel to develop a “Fisheries Ecosystem Plan for Chesapeake Bay.” 2000- 2006.

Fisheries Steering Committee. Principal Fisheries Managers from Chesapeake Bay Program, NOAA, Atlantic States Marine Fisheries Commission, MD DNR, VMRC, PRFC. Oversight, Coordination and Planning Committee to coordinate fisheries management in Chesapeake Bay. 2001- 2007.

Chesapeake Bay Program. Chair and Convenor of Workshop on ‘Spatial Management in Chesapeake Bay,’ by Scientific and Technical Advisory Committee, April 2004.

Maryland Sea Grant, “Dissolved Oxygen Workshop.” Member of Steering Committee and workgroup co-chair, 2004.

Maryland, Governor’s Task Force on Fisheries Management. Appointed Chair of Peer Review Group, 2007-.

Maryland Sea Grant Ecosystem-Based Fishery Management Planning Project.
Menhaden : Biological Background Development Team, Chair and Team Leader, 2008-

Maryland Sea Grant Ecosystem-Based Fishery Management Planning Project.
Quantitative Evaluation Team, 2008-

Chesapeake Research Consortium, Conference on Ecosystem Based Management.
Co-convenor of session “Developing, adopting, and implementing EBFM in Chesapeake Bay. 2009.

D. National/International

Scientific and Statistical Committee, Mid-Atlantic Fishery Management Council, 1981-

Recruitment Processes Working Group, International Council for the Exploration of the Sea, 1990-

Interagency Ecological Program for the San Francisco Bay/Delta Estuary Program, Scientific Advisory Group, 1994-

Member, U.S. delegation to International Council for the Exploration of the Sea. Committee on Living Resources, 1997-2008

Florida Bay Program, Science Oversight Panel. Several Federal Agencies, 1999-

Research Vessel Design Committee. University of Delaware and Universities National Oceanographic Laboratory System (UNOLS). 2000-2006.

North Pacific Research Board, Science Advisory Panel, 2002-2004.

NOAA, NMFS Panel: Graduate Fellowships in Marine Fisheries Population Dynamics. Reviewer/evaluator, 2004.

National Research Council, Board on Environmental Studies and Toxicology. Review Coordinator for “Review of AYK (Western Alaska) Research and Restoration Plan for Salmon, Part 1,” 2005.

NOAA Marine Protected Areas Center. Appointment to Technical Working Group to integrate MPAs with conventional fisheries science and management. 2004-2005.

Panel Member, “Ecosystem-Based Approaches to Fisheries Management.” Conference on Managing Our Nation’s Fisheries. Regional Fisheries Management Councils, Washington, D.C., 2005.

Panel Member and Advisor, Workshop on “Predation Issues in Water Projects in the San Francisco-Bay-Delta.” CALFED, Tiburon, CA, 2005.

National Research Council, Board on Environmental Studies and Toxicology. Review Coordinator for “Review of AYK (Western Alaska) Research and Restoration Plan for Salmon, Part 2” 2006.

U.S. Delegate to the International Council for the Exploration of the Sea (ICES). U.S. State Department appointment, 2006-

International Council for the Exploration of the Sea (ICES). Chair of Awards Committee (Outstanding Achievement and Prix d’Excellence), 2006-

CAMEO (Comparative Analysis of Marine Ecosystem Organization) appointed to Interim Steering Committee, NOAA and NSF, 2007- 2008.

Scientific and Statistical Committee, Regional Fisheries Management Councils, National Workshop, Honolulu, HI, November 2008.

CAMEO (Comparative Analysis of Marine Ecosystem Organization), appointed to Steering Committee, NOAA and NSF, 2009-

E. University System of Maryland, UMCES and Laboratory

University of Maryland Ocean Institute Task Force, 2002-2005.

CBL Library Committee, Chair, 1999-

Represent UMCES in University consortium to promote development of a NOAA/Universities Cooperative Marine Education and Research (CMER) Program, 2002-2004.

University of Maryland Eastern Shore. Member of Technical Advisory Board to the NOAA

“Living Marine Resources Cooperative Science Center,” 2004-2008.

UMCES New Research Vessel Planning Committee, 2004-2008

UMCES ‘Promotion and Tenure Appeals’ Panel, 2004.

UMCES Strategy Implementation Leadership Team (SILT), for “Science to Support Ecosystem-Based Management, 2005-

UMCES Strategy Implementation Leadership Team (SILT), for “Regional Consequences of Climate Change and Variability, 2005-

Co-Chair of CBL Distinguished Scholars Seminar Series, Spring 2007.

UMCES, Faculty Comprehensive Review Committee, 2007.

G. Other Professional Services (since 2004 and current)

Estuary Enhancement Environmental Program, Advisory Committee to Public Service Electric and Gas Company, Delaware Bay and Estuary, 2001-

Sette Award Selection Committee, American Fisheries Society. Recognizes lifetime achievement in marine fisheries science, 2004-

Appointed to “Promotion Review Advisory Committee.” Smithsonian Environmental Research Center, 2005-2007.

Reviewer, NAS-NRC Report on Ocean Research Priorities Plan (ORPP) by JSOST, 2007.

Selection Committee, Steven A. Berkeley Marine Conservation Fellowship, American Fisheries Society, 2008-

Lenfest Foundation, appointed to its Forage Fish Task Force, 2009-